EXHIBIT A

RESPONSIBILITY MATRIX

Version--→	INTERIM PLATFORM		SS7/COBRA	
Item/Device	**TNT (RAD)**		**TNT (RAD)**	**SS7 Gateway**
• Ownership	USWC		USWC	USWC
• Hardware configuration	USWC		USWC	USWC
• Software configuration	UUNET		UUNET	USWC
• Hardware Alarms and Diagnostics	UUNET		UUNET	USWC
• Hardware Repair	USWC		USWC	USWC
• NMS Functions	UUNET		UUNET	USWC
• Install Hardware	USWC		USWC	USWC
• Software Alarms and Diagnostics	UUNET		UUNET	USWC
• Install Software	UUNET		UUNET	USWC
• Software Repair	UUNET		UUNET	USWC
• Physical Access to Hardware	USWC		USWC	USWC
• Software Certification Testing	Joint		Joint	USWC
• NMS Access	UUNET		UUNET	USWC
• End-user demand and locations (LSOs)	UUNET		UUNET	NA
• Network Topology • RAD Locations • COBRA Locs	USWC		USWC	USWC
• Network Capacity Planning	Joint		Joint	USWC

ORIGINAL

COPY

SBC & UUNET MSA
SERVICE SCHEDULE A

DIAL ACCESS SOLUTION – INTERNET SERVICE PROVIDER

This Service Schedule is entered into by the parties pursuant to the Master Services Agreement between SBC Global Services, Inc. ("SBC") and UUNET Technologies, Inc. ("UUNET" or "Customer"), dated December 31, 1999 ("Agreement"). The Agreement and this Service Schedule, along with any applicable tariffs identified herein, set forth the terms and conditions applicable to the provision of Dial Access Solution – Internet Service Provider services ("DAS Services") by SBC and its affiliates. Words and phrases defined in the Agreement shall have the same meaning in this Service Schedule. This Service Schedule shall be effective as of December 31, 1999 ("Service Effective Date").

A.1. Service Description; Demarcation.

(a). The DAS Services provide integrated, remote dial access service to Customer, its end users, and the end users of Customer's clients and resellers via modems referred to as network access servers ("NAS") deployed in central offices operated by SBC or an SBC affiliate classified as an incumbent local exchange carrier ("SBC COs"). The DAS Services provide medium to high-speed data transport services for remote dial access to Customer's network. The DAS Services permit Customer to receive calls from multiple analog modems and ISDN basic rate interface lines for handoff to separately purchased wide area network links. SBC shall connect each NAS used in connection with the DAS Services provided hereunder to the Public Switched Telephone Network ("PSTN") via ISDN primary rate interface ("PRI") or comparable telecommunications facilities, and shall arrange for the dedicated assignment of unique telephone numbers for use by Customer, its end users (for example, America OnLine), and the end users of Customer's clients (for example, a subscriber to America OnLine). SBC shall bill Customer for the use of the DAS Services in accordance with the provisions of the Agreement and this Service Schedule.

(b). The DAS Services include all equipment, telecommunications services and related facilities (including without limitation active PRI lines, at least 40 DID numbers per rotary, space, power, and other utilities), and ancillary support and maintenance required to connect a call which has been dialed into the PSTN (such call dialing a designated telephone number) to an active DS0 channel-equivalent port (i.e., PRI B-channel) on the corresponding NAS ("DAS Port"). The demarcation of the DAS Services between SBC and Customer shall be at the connection of the NAS egress port to the egress circuit connecting the NAS to the SBC or SBC affiliate's wide area network and/or Customer's network.

A.2. Applicable Service Territory. The prices set forth in this Service Schedule shall apply to all DAS Services purchased hereunder for deployment in those SBC COs where DAS Services are available from SBC and/or its current and future affiliates. SBC agrees to use commercially reasonable efforts to make the DAS Services available in all SBC COs.

A.3. Service Ordering Procedure.

(a). Customer shall provide SBC with a request for information ("RFI") in writing identifying (i) the number of DAS Ports being considered for deployment by Customer; and (ii) the geographic location (for a new rotary) or the central office (for the expansion of an existing rotary) for such identified DAS Ports.

(b). SBC shall have seven (7) calendar days from receipt of such RFI to advise Customer in writing whether (i) SBC agrees to provision such identified DAS Ports within the SLA installation time frame set forth in Section A.10(c) below; (ii) SBC agrees to provision such identified DAS Ports within an alternative, reasonable time frame that is greater than the SLA installation time frame set forth in Section A.10(c) below; or (iii) SBC does not agree to provision such identified DAS Ports.

(c). In the event that SBC responds affirmatively to Customer's RFI (in other words, provides a response pursuant to Sections A.3(b)(i) or A.3(b)(ii) above), Customer shall have seven (7) calendar days from receipt of SBC's written response to send SBC a firm and binding order in writing ("Firm Order") for the identified DAS Ports. Once SBC receives Customer's Firm Order, any cancellation by Customer of such Firm Order shall be subject to any applicable early termination charges as set forth in Section A.14 below, unless otherwise provided by the Agreement or this Service Schedule. If Customer does not send SBC a

Firm Order within seven (7) calendar days from receipt of SBC's written response, Customer's RFI and SBC's response thereto shall be deemed to have expired.

(d). In the event that SBC responds negatively to Customer's RFI (such negative response not being caused by an event of Force Majeure or SBC's inability to secure NAS equipment meeting Customer's specifications), SBC agrees that the number of identified DAS Ports thereafter shall count towards: (i) Customer's satisfaction of any applicable minimum purchase commitment set forth in Section A.8 below; and (ii) the number of active and ordered DAS Ports pursuant to Section A.4(a) below. In the event that SBC responds affirmatively in part and negatively in part regarding the DAS Ports identified in Customer's RFI, this Section A.3(d) shall apply only with respect to those DAS Ports for which SBC does not agree to provision.

A.4. Service Prices.

(a). The monthly fee per DAS Port for a given calendar month shall be based on the number of active DAS Ports, plus the number of DAS Ports identified in any Firm Orders issued by Customer, plus the number of DAS Ports subject to the provisions set forth in Section A.3(d) above, plus the number of DAS Ports subject to the provisions set forth in Section A.10(e) below, plus the number of DAS Ports subject to the provisions set forth in Section A.14(e) below, and plus the number of DAS Ports subject to the provisions set forth in Section A.15 below, all of which to be determined as of the last day of such month, in accordance with the following table and subject to the Minimum Purchase Commitment set forth in Section A.8 below:

Active & Ordered DAS Ports	Monthly Fee per DAS Port
0 – 400,000	$25.50
400,001 – 500,000	$24.50
500,001 +	$24.00

(b). No non-recurring charges shall apply with respect to the DAS Services provided that the Minimum Purchase Commitment set forth in Section A.8 below is met. To the extent that any applicable tariff includes non-recurring charges, SBC agrees that such non-recurring charges already have been factored into the monthly fee for the DAS Services as set forth above; provided that all other performance obligations of Customer described in this Service Schedule, including the Minimum Purchase Commitment set forth in Section A.8 below, are met.

A.5. Service Acceptance Procedures. Customer's acceptance of new or migrated DAS Ports at a given location shall be made promptly following the successful completion of service acceptance tests conducted jointly by the parties. At a minimum, such service acceptance tests shall include the login and RADIUS authentication to Customer's network via the newly deployed DAS Ports.

A.6. Service Billing Procedures. SBC shall bill Customer monthly in arrears based on the applicable monthly fee specified in Section A.4(a) above for all active DAS Ports as of the last day of the preceding month.

A.7. Egress Circuit Access. The prices set forth herein for the DAS Services include any applicable NAS egress port fees, but exclude any egress circuit charges. SBC agrees, to the extent consistent with its then current policies applicable to similar interconnections, to fully cooperate with Customer and any third-party provider selected by Customer to connect any SBC NAS or SBC wide area network equipment to Customer's network via an egress circuit provisioned by such third-party provider to an SBC central office or SBC wide area network location. SBC shall be compensated by Customer for any work associated with such interconnection to the extent SBC is compensated by third parties for similar work.

A.8. Minimum Purchase Commitment. Customer agrees to maintain a minimum of 300,000 active DAS Ports each month beginning with the first day of the thirteenth (13th) month after the Service Effective Date ("Minimum Commitment Date"). In the event that Customer does not have 300,000 active DAS Ports during a given month after the Minimum Commitment Date, Customer agrees to pay SBC for 300,000 DAS Ports in each such month

regardless of the actual number of active DAS Ports. This minimum purchase commitment shall expire as of the end of month 60 after the Service Effective Date.

A.9. NAS Equipment.

(a). Ownership. SBC or its affiliates shall own all of the NAS equipment used in connection with the DAS Services.

(b). Selection. In providing the DAS Services, SBC agrees only to use NAS equipment that is approved by Customer in advance in writing. For any given Firm Order, the parties shall cooperate to determine the applicable NAS equipment to be deployed in connection with those new DAS Ports.

(c). Support & Maintenance. SBC or its affiliates shall provide Customer with 24x7x365 NOC-to-NOC technical support. SBC shall proactively maintain all NAS equipment (along with all related equipment) used in connection with the DAS Services. SBC will examine its processes and consider revisions in servicing Customer's accounts in an ongoing effort to provide improved customer service for Customer.

(d). Operational Control. Notwithstanding Section A.9(c) above, Customer shall be exclusively responsible for the operational control (i.e., logical access) of all NAS equipment used in connection with the DAS Services. Customer shall be exclusively responsible for the purchase, installation, and management of all software upgrades for the NAS equipment. SBC shall assist Customer in the resolution of any NAS equipment failure in accordance with agreed-upon maintenance procedures. SBC shall have no responsibility for the authentication of end users accessing the DAS Services. Customer shall be exclusively responsible for controlling all end user access to the DAS Services. Customer agrees that SBC shall not be responsible under the Agreement or this Service Schedule for any failure by Customer to properly operate the NAS equipment. If Customer causes the failure of any NAS equipment, Customer shall pay SBC the reasonable costs for repairing such NAS equipment in accordance with agreed-upon maintenance procedures and any resulting fee schedules.

(e). Technology Upgrades. In the event that the manufacturer of NAS equipment used in connection with the DAS Services offers a hardware upgrade to such NAS equipment, the parties shall confer and mutually agree as to whether to deploy such hardware upgrade in connection with the DAS Services. In the event that such hardware upgrade involves any out-of-pocket costs, the parties also shall agree upon the appropriate cost sharing arrangement.

A.10. Service Level Agreements ("SLA").

(a). Service Availability. Service outage credits may be claimed by Customer when any DAS Port is interrupted or does not meet performance standards for any period lasting one (1) or more consecutive hours. No credit will be available if the interruption is caused by (i) the failure of Customer to properly operate the NAS equipment as set forth in Section A.9(d) above; (ii) the negligence or willful misconduct of Customer; or (iii) an event of Force Majeure as provided in the Agreement. The amount of the credit shall be equal to the pro-rata monthly fee due for all affected DAS Ports during which a confirmed outage has occurred, including the initial one (1) hour. Outages may be confirmed only by an SBC employee authorized to make such determinations and will be calculated in ½-hour increments, or major fraction thereof, of the interruption.

(b). Service Failure Response Times. SBC shall use commercially reasonable efforts to diligently respond and repair any service failure based upon the grade of the failure, in accordance with the tables set forth below.

GRADE	OUTAGE / PROBLEM
1	PRI outage between the telephone switch and the NAS equipment
1	No response from maintenance ports on any NAS or associated equipment located in a central office.
1	More than 30% of the modems at any one central office are not responding
1	Any "single point of failure" piece of hardware outputting major alarms
2	Less than 30% of the modems at any one central office are not responding
2	Any "single point of failure" piece of hardware outputting minor alarms
3	Any non-service affecting problem on any associated equipment located in a central office.
3	Requests for documentation
3	Requests for call back on non-service affecting issues

GRADE	TIME FRAME TO RESPOND / REPAIR
1	Mean time to respond: 30 minutes
1	Mean time to repair: 4 hours
2	Mean time to respond: 2 hours
2	Mean time to repair: 12 hours (hardware is onsite)
2	Mean time to repair: 24 hours (hardware must be ordered)
3	Mean time to respond: 4 hours
3	Mean time to repair: By end of next business day

(c). Installation Objective. SBC agrees to use commercially reasonable efforts to install all new DAS Ports within forty-five (45) calendar days after receipt of a Firm Order from Customer. SBC immediately shall provide written notice to Customer in the event that SBC determines after beginning the DAS Port installation process that it will not be able to meet this installation objective, and upon receipt of such notice Customer may cancel the ordered DAS Ports without liability for any termination charges.

(d). PRI Service Objective. SBC agrees to use commercially reasonable efforts to deploy the DAS Services via PRI facilities.

(e). Operations Reviews & Chronic Failures. Each calendar quarter the parties shall conduct an operations review at which time SBC shall present analyses of its performance against the foregoing SLA provisions. If SBC does not meet the combined Grade 1 and Grade 2 response and repair times for more than ten-percent (10%) of all Grade 1 and Grade 2 failures in a given month ("Chronic Failure") after there are at least 50,000 active DAS Ports during the first 12 months after the Service Effective Date, and at any time

thereafter provided Customer is satisfying the Minimum Purchase Commitment set forth in Section A.8 above, both parties agree to: (i) within seven (7) calendar days after the operations review, meet to determine the nature and source of such performance deficiencies and to develop mutually agreeable remedies and timelines to improve performance; (ii) escalate the identified deficiencies to SBC senior management for enhanced performance oversight; and (iii) negotiate in good faith a mutually-agreeable monetary settlement with respect to the identified performance failures. In the event that SBC has Chronic Failures affecting more than 15,000 active DAS Ports during two successive calendar quarters after the beginning of the thirteenth (13th) month following the Service Effective Date (and Customer is satisfying the Minimum Purchase Commitment set forth in Section A.8 above), Customer may terminate the affected DAS Ports without liability for any termination charges. Any DAS Ports cancelled by Customer due to Chronic Failures shall continue to count towards: (i) Customer's satisfaction of any applicable minimum purchase commitment set forth in Section A.8 above; and (ii) the number of active and ordered DAS Ports pursuant to Section A.4(a) above.

(f). Escalation Matrix. SBC agrees to provide Customer with an operations and senior management escalation matrix, and to update and maintain such matrix on a current basis for the service term of this Service Schedule. Such matrix shall include email addresses and telephone access numbers for operations and senior management points of contact who are available and authorized to address and resolve Service performance issues on a 24x7x365 basis.

A.11. Migration of Existing Capacity.

(a). The parties acknowledge that the migration of existing PRI services provided by SBC affiliates to Customer ("PRI Services") may require the installation of certain equipment and facilities. Consistent with the availability of such equipment and facilities, the migration of the PRI Services to the DAS Services hereunder shall be established pursuant to an installation schedule to be agreed upon by the parties in writing during the thirty (30) days following the Service Effective Date. Successful migration of any portion of such PRI Services shall be deemed to have occurred when the replacement DAS Services are provided to and accepted by Customer pursuant to Section A.5 above. SBC agrees that all existing telephone numbers shall be preserved in the migration to the DAS Services unless otherwise agreed-upon by Customer in advance in writing.

(b). The rates included in this Service Schedule are not valid for PRI Services until the circuits are converted to the DAS Services. Once a circuit is converted, it falls under the terms and conditions of the Agreement and this Service Schedule. All migrated DAS Ports shall be deemed to have been installed during calendar year 2000. In the event such conversion would impose upon Customer any termination penalties associated with SBC affiliate services, SBC and Customer agree that they will cooperate with each other, and any other SBC affiliate, to arrange the offering of services hereunder in a mutually agreeable manner that fully avoids the impact of such termination penalties.

(c). To the extent that SBC adds new DAS Services ordered hereunder to any given central office, SBC also shall migrate all PRI Services connecting to such central office at the same time.

(d). SBC shall commence the migration of all PRI Services to the DAS Services upon the Service Effective Date. All migrated DAS Ports shall be deemed to have been ordered by Customer as of the Service Effective Date. Subject to Section A.11(b) above, the parties' objective shall be to migrate all PRI Services to the DAS Services within six (6) months of the Service Effective Date. In the event that any PRI Services are not successfully migrated to the DAS Services by such deadline, SBC agrees to bill for all PRI Services that remain to be migrated at the rates set forth herein and to use its best efforts to complete the migration as expeditiously as possible.

(e). If the migration of PRI Services is delayed due to changes initiated by Customer or the acts or omissions of Customer, or due to any Force Majeure event, SBC shall have the right to extend the migration deadline for the affected PRI Services by the period of such delay. All such delays shall be communicated as soon as practical between Customer's project coordinator and SBC's project manager.

A.12. Service Portability. Beginning as of January 1, 2001, Customer may during the course of each calendar year terminate up to 10% of the total number of active DAS Ports as of January 1st of such calendar year without

liability for any early termination charges; provided that (i) the number of new DAS Ports ordered by Customer during such calendar year is equal to or greater than the number of DAS Ports terminated during such calendar year; and (ii) the terminated DAS Ports have been in service for at least 8 months. During the first 12 months after the Service Effective Date, Customer may terminate up to 30,000 DAS Ports; provided that the foregoing portability conditions shall apply. Customer shall be liable for any applicable early termination penalties in accordance with Section A.14 below for any excess DAS Ports terminated by Customer, or if Customer fails to satisfy the foregoing portability conditions with respect to any terminated DAS Port.

A.13. Applicable Federal, State, or Local Tariffs.

(a). The parties acknowledge that various tariffs may apply with respect to the DAS Services that are provided by SBC in certain states and/or other identified locations. Within 30 days of the Service Effective Date, SBC shall provide Customer with a list of all such applicable tariffs and the corresponding territories.

(b). In the event that SBC is required to make any tariff filings with respect to this Service Schedule, SBC agrees to provide Customer with a draft of such tariff filing for Customer's review, comment, and approval, which shall not be unreasonably withheld, conditioned, or delayed by Customer. SBC agrees to afford Customer a reasonable period of time to conduct such review, but no less than ten (10) calendar days, and to incorporate or otherwise address any reasonable comments provided in writing by Customer to SBC. In no event shall such a tariff filing be inconsistent with or contrary to the terms and conditions of the Agreement or this Service Schedule. Notwithstanding anything in this Service Schedule or the Agreement to the contrary, in no event may Customer receive credit for DAS Ports cancelled due to the time the DAS Services could not be provided while Customer was reviewing a proposed tariff filing. In addition, in the event that regulatory decisions, as interpreted by SBC in its reasonable discretion, make the assignment of this Service Schedule to an SBC affiliate advisable to SBC, then SBC shall have the right to make such assignment; provided that the terms and conditions of this Service Schedule shall not be modified as a result of such assignment.

A.14. Service Term & Early Termination Liabilities.

(a). The service term of this Service Schedule shall expire as of the expiration or termination of the last active DAS Port provided hereunder.

(b). Each DAS Port shall be in service until the initial expiration date applicable to such DAS Port based on the year in which such DAS Port was installed by SBC and accepted by Customer, in accordance with the table below.

Year Installed	Initial Expiration Date
2000	12/31/04
2001	12/31/05
2002	12/31/06
2003	12/31/07
2004	12/31/08

(c). Upon the applicable initial expiration date for a given DAS Port, such DAS Port automatically shall be renewed on a month-to-month basis, unless either party provides the other party with thirty (30) days prior written notice of its intent not to renew such DAS Port.

(d). Except as otherwise provided in the Agreement or this Service Schedule (including without limitation Section A.12 above), if Customer cancels a given DAS Port prior to its applicable initial expiration date, Customer shall pay an early termination charge equal to the number of months remaining until the applicable initial expiration date for such DAS Port, times the then-current monthly fee per DAS Port, times the applicable termination percentage based upon the number of months that such DAS Port was in service in accordance with the following table:

Months in Service	Termination Percentage
0 – 12	100%
13 – 36	90%
37 – 60	80%

(e). Any DAS Port that Customer cancels and for which pays a termination charge as set forth in Section A.14(d) above shall continue to count towards: (i) Customer's satisfaction of any applicable minimum purchase commitment set forth in Section A.8 above; and (ii) the number of active and ordered DAS Ports pursuant to Section A.4(a) above.

A.15. Sale of Assets. In the event that SBC or its affiliate sells any network assets used in connection with the DAS Services to a third party, the number of DAS Ports associated with the network assets sold by SBC or its affiliate shall continue to count towards: (i) Customer's satisfaction of any applicable minimum purchase commitment set forth in Section A.8 above; and (ii) the number of active and ordered DAS Ports pursuant to Section A.4(a) above.

A.16. Annual Review. Beginning in January 2001, the parties shall meet on an annual basis each January to review and discuss the DAS Services' architecture and equipment, market conditions, and the market competitiveness of the prices and commitment levels set forth herein, as well as any business, performance, or operational issues as may arise between the parties. The parties also shall discuss the deployment of future technologies in SBC's networks, including without limitation alternative call delivery technologies (e.g., SS7 and/or soft switch technologies), and any corresponding price decreases associated with such deployment. The parties agree to negotiate in good faith to maintain the competitive viability of this Service Schedule.

A.17. COBRA Architecture White Papers. The following two (2) white papers set forth certain technical parameters and operational requirements applicable to the DAS Services provided hereunder.

(a). Lucent/Ascend Equipment. See Exhibit A-1 to this Service Schedule.

(b). 3com Equipment. See Exhibit A-2 to this Service Schedule.

AUTHORIZED APPROVALS

UUNET TECHNOLOGIES, INC.

By: _____

Printed Name: Peter W. Radcliffe

Title: Director, Global Cap Acq.

SBC GLOBAL SERVICES, INC.

By: _____

Printed Name: R. Wilkins

Title: Pres: SBC-BCS

Approved By UUNET LEGAL Department

By: _____

Signature

Date 1/28/00

EXHIBIT 4: Qwest ANS COBRA Pricing: 3Com Total Control Equipment Configuration (6/27/01)

3Com TC/DC (HDM) CONFIGURATION (336 modem ports per chassis)

Part No.	Description	Qty.	Virtual COBRA Price (US$)	COBRA Price (US$)
3C0504776-00	Total Control DC Mgmt. Chassis (per cabinet/rack of 4 modem chassis)	1	$ 1	$ 3,999
003458-00	*TCH Dual 130A/DC Power w/ HiPerNMC Card Set*	*1*	*Included*	*Included*
003802-01	*EdgeServer OverDrive, 256mb, 2x2GB HD*	*1*	*Included*	*Included*
003281-00	*16 port Serial NIC*	*1*	*Included*	*Included*
001893-00	*Pentium Pro Processor*	*1*	*Included*	*Included*
002157-01	*Dual 10/100 BaseT Ethernet NIC*	*1*	*Included*	*Included*
000849-12	*Quad Analog Digital Modem Card Set*	*1*	*Included*	*Included*
003458-00	TCH Dual 130A/DC Power w/ HiPerNMC card set (per modem chassis)	1	$ 1	$ 1,999
002106-01	HiperARC Card Set (Ethernet) (per modem chassis)	1	$ 1	$ 1,999
002092-00	HiPerDSP Card Set (24 ports/card) (per modem chassis)	14	$ 14	$ 30,870
Cisco7206/VXR	Cisco 7206 DC VXR (per 8 modem chassis) (T3 or 8xT1 card)	1	$ 1	$ 21,999
WS-C2924M-XL-EN-DC	Cisco 24-port DC NEBS switch	1	$ 1	$ 2,967
WCOM COBRA SW	WCOM 3Com-TC Custom Software Bundle (WCOM use only)	1	N/C	N/C
Total System Price	*(1 modem chassis per cabinet)*		$ 19	$ 63,833
Total System Price	*(2 modem chassis per cabinet)*		$ 35	$ 98,701
Total System Price	*(3 modem chassis per cabinet)*		$ 51	$ 133,569
Total System Price	*(4 modem chassis per cabinet)*		$ 67	$ 168,437

Pricing Notes

1. Average Lucent TNT COBRA price = $132.73 per port ($63,711/480). Average 3Com COBRA price (3 modem chassis) = $132.51 per port ($133,569/1008)
2. Virtual COBRA pricing ($1/port) valid only for RAS Equipment purchased by Qwest for use directly in support of WCOM's purchase of Virtual COBRA services from Qwest
3. Prices are exclusive of EF&I hardware and services (e.g., cabinets/racks, panels, cables, OOB mgmt devices, ancillary components, rack/stack services, and site preparation, engineering, and installation services and materials), which are the responsibility of Qwest
4. Cisco 7206 may use DS3, 4xDS1, or 8xDS1 cards (depending on egress capacity requirements from a given site)
5. Prices are exclusive of shipping, insurance, taxes, and duties, which are the responsibility of Qwest

AMENDED AND RESTATED EXHIBIT B
Verizon/WCOM CyberPOP™ 3Com Total Control Equipment Configuration (5/4/04)

3Com TC/DC (HDM) CONFIGURATION (336 modem ports per chassis)

Part No.	Description	Qty.	Virtual COBRA Price (US$)
3C0504776-00	Total Control DC Mgmt. Chassis (per cabinet/rack of 4 modem chassis)	1	$1
003458-00	*TCH Dual 130A/DC Power w/ HiPerNMC Card Set*	*1*	*Included*
003802-01	*EdgeServer OverDrive, 256mb, 2x2GB HD*	*1*	*Included*
003281-00	*16 port Serial NIC*	*1*	*Included*
001893-00	*Pentium Pro Processor*	*1*	*Included*
002157-01	*Dual 10/100 BaseT Ethernet NIC*	*1*	*Included*
000849-12	*Quad Analog Digital Modem Card Set*	*1*	*Included*
003458-00	TCH Dual 130A/DC Power w/ HiPerNMC card set (per modem chassis)	1	$1
002106-01	HiperARC Card Set (Ethernet) (per modem chassis)	1	$1
002092-00	HiPerDSP Card Set (24 ports/card) (per modem chassis)	14	$14
Cisco7206VXR	Cisco 7206 DC VXR (per 8 modem chassis)	1	$1
3C39036-DC or Cisco WS-C2924M-XL-EN-DC	3Com 3900 DC Ethernet Switch or Cisco 24-port DC NEBS switch (per cabinet/rack of 4 modem chassis)	1	$1
WCOM COBRA SW	WCOM 3Com-TC Custom Software Bundle (WCOM use only)	1	N/C
Total System Price			**$19**

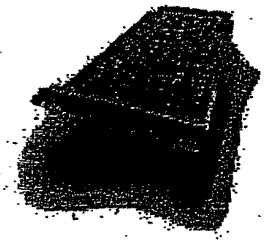
Pricing Notes

1. Virtual COBRA pricing ($1/part) valid only for RAS Equipment purchased by Verizon for use in support of WCOM's purchase of CyberPOP service from Verizon
2. Prices are exclusive of EF&I hardware and services (e.g., cabinets/racks, panels, cables, OOB mgmt devices, ancillary components, rack/stack services, and site preparation, engineering, and installation services and materials), which are the responsibility of Verizon
3. The Cisco 7206 may use DS3, 4xDS1, or 8xDS1 cards (depending on egress capacity requirements from a given site)
4. For certain GridNet sites, a carrier access mux may be required to support DS3 ingress, subject to Verizon NEBS compliance
5. Prices are exclusive of shipping, insurance, taxes, and duties, which are the responsibility of Verizon
6. In light of 3Com's plans to "end of life" the 3Com 3900 DC Ethernet Switch, the Cisco 24-port DC NEBS Switch may be used instead

PF

Total Control Platform with HiPer Access System Card Sets

HiPer DSP Card Set

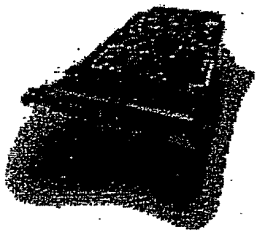


The advanced design of the HiPer DSP card set enables multiple modem sessions, ISDN processing, voice-codecs, and PPP co-processing on a single DSP (digital signal processor)—delivering a high level of functionality in a small space. The card set can process a T1/E1 span's worth of channels (24 or 30 channels respectively) while occupying just one platform slot.

In a fully populated Total Control platform, the HiPer DSP card set can handle up to 336 calls via T1 and up to 420 calls via E1.

Unlike a simple modem card, the HiPer DSP card set features a fully reprogrammable digital signal processing engine that lets administrators reconfigure the system to implement new technologies and applications such as voice-over-IP. The card set supports a full range of trunk and communications standards, including many variations of CAS/PRI 56K V.90*, 3Com x2*** technology, and all of the most common ITU-T and Bell communications standards and rates (including V.34, V.32terbo, V.32, and V.32bis, H.323-RTP and G.7231.1)

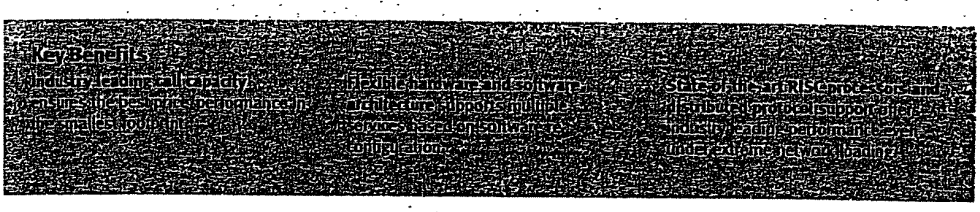
HiPer Access Router Card Set



The HiPer access router card set works with the HiPer DSP card set to process the packet content of digital and analog connections and route user data, at wire speeds, to various LAN/WAN interfaces.

The HiPer access router supports a broad set of LAN and WAN protocols and provides full access routing functionality, including per-user firewalls with application and protocol filtering. STAC compression, RIP and RIP Version 2, plus RADIUS and other user authentication support.

Occupying one slot each, two HiPer access router card sets can be configured to provide load sharing and redundancy for increased access router performance. Support for SNMP management, call activity logging and RADIUS accounting ensure a high level of oversight and control over network access activities.



Specifications

Total Control Multiservice Access Platform

HiPer Access Router System

Power Requirements

Example of a Fully Loaded System: 96A max.

- 14 HiPer DSP NIC/NAC sets
- 2 HiPer access router NIC/NAC sets
- 1 Network Management NIC/NAC set

HiPer DSP NIC/NAC set: 5.4A max.

HiPer access router NIC/Ethernet NAC set: 7.0A max.

EdgeServer Pro card: 15A max

Network Management card: 5.0A max.

Physical Dimensions

Total Control Platform

Height: 8.75 in/ 22.2 cm

Width: 17.3 in/ 43.6 cm

Depth: 18.6 in/ 47.2 cm

Operating Environment

Temperature: 30°–104°F (0°–40°C)

Humidity: 0-95% noncondensing

Regulatory/Agency Approvals

Complies with FCC Part 15, Class A requirements for Radiated and Powerline Conducted Emissions

FCC Part 68 approved

NEBS Level 3 support

UL and C-UL (CSA equivalent) Listed under UL 1950, Information Technology Equipment

CE

HiPer DSP Card Set

Physical Interfaces

T1/T1-PRI and E1/E1-PRI:

One RJ-45 T1/E1 port

One RJ-45 RS-232-emulated connector for local management console

One Dual 1/8 in. bantam monitor jack (T1 version only)

Power Requirements

T1 NIC + 24 channel HiPer DSP NAC: 4.8A typical (24W)

E1 NIC + 30 channel HiPer DSP NAC: 5.2A typical (26W)

Primary Rate Interface Compliance

Compliant with AT&T technical publication TR41459 and compatible with AT&T ISDN PRI services

Laboratory Testing

ISDN data link layer ITU-T Q.921

ISDN call control signaling ITU-T Q931/L451

Provides ANI and DNIS digits via Q.931 D-channel signaling

Supports NonFacility Associated Signaling (NFAS) with D-channel backup

E&M Type II Signaling (T1 interfaces)

Channelized T1 robbed bit signaling

Loop Start

Ground Start

E&M wink start

E&M immediate

E&M FGD

E&M FGB

T1 CR22

Central Office Switch Signaling Support (ISDN)

AT&T 4ESS Custom

AT&T 5ESS Custom

Northern Telecom DMS-100 Standard

Northern Telecom DMS-250

INS 1500

ER11

National ISDN 2 (NI2)

Digital Data Compatibility

For end-to-end transmission over ISDN: Sync PPP, ITU-T V.120/I.462, ITU-T V.110/I.463, 64 Kbps and 56 Kbps clear channel HDLC, X.75

T1/E1 Interface

Metallic interface per ANSI T1.403

CSU to T1 per AT&T Pub 62411

PRI interface per ANSI T1.408

D4 or ESF frame formats

B8ZS line coding

Auto equalization for data and clock recovery (36dB)

Supports local and remote loopbacks

E1 Interface

Metallic interface per ITU-T G.703

PRI interface per ETS 300 011

HDB3 line coding

ITU-T G.704 framing with and without CRC-4

Modulation Support

V.90 (56 Kbps*)

x2 (56 Kbps*)

V.34 (33.6 and 28.8 Kbps)

V.32terbo (19.2 Kbps)

V.32 (9600 and 4800 bps)

V.32bis (14.4 Kbps, 12 Kbps, 9600 bps, 7200 bps and 4800 bps)

V.22 (1200 bps)

V.22bis (2400 bps)

V.25

Bell 212A (1200 bps)

Bell 103

Error Correction

ITU-T V.42

MNP 2-4

Data Compression

ITU-T V.42bis

MNP 5

Voice Over IP (optional) CODEC Support

Line Echo Cancellation

ITU G.723.1

ITU-G.165

Protocols

ITU H.323

RTP

PPP

HiPer Access Router Card Set

Physical Interfaces

Dual, auto-sensing 10/100 Ethernet interfaces

Two RJ-45 10BASE-T/100BASE-T

One RJ-45 RS-232-emulated connector for local management console

Power Requirements

10/100 Ethernet NIC + HiPer access router NAC: 6.2A typical (31W)

Client Dial-Up Support

PPP with automatic PPP detection

SLIP, CSLIP

Telnet

DHCP

Rlogin

STAC compression

IP address pooling

Routing Support

RIP version 2

Transparent on-demand routing

IP protocol routing

Support for host, subnet, and network routers

Administration

Local flash ROM for booting and configuration storage

Support for Domain Name Service (DNS)

Call activity logging

SNMP management; MIB II and additional MIBs

Telnet command line interface

Ping utilities

Dial-in administrative access

RADIUS accounting

Filtering and Security

IP protocol filtering

Set inbound and outbound packet filtering independently

Compatible with RADIUS authentication servers

IP address assignment per router or per port

PPP Specific Features

STAC Data Compression for PPP payload

Address and control field compression

PAP and CHAP authentication protocols

Magic number loopback detection

Maximum receive unit negotiation

Async control character map negotiation

IP address negotiation and assignment

Van Jacobson compression TCP/IP headers

Industry Standards Support

ARP (Address Resolution Protocol)

CCP (compressed PPP) with support for STAC algorithms

CSLIP (compressed SLIP)

ICMP (Internet Control Message Protocol)

IP (Internet Protocol)

PPP (Point-to-Point Protocol)

RFC 1331, 1332, and 1334 for PPP

RIP (Routing Information Protocol) and RIP Version 2 with optional authentication

SLIP (Serial Line Internet Protocol)

TCP (Transmission Control Protocol)

Telnet

UDP (User Datagram Protocol)

CIDR

EdgeServer Pro Card

System Requirements

HiPer DSP card set, or Dual T1, E1, or PRI card set with Quad V.34 Modem cards

Power Requirements

15A max

Hardware Set

EdgeServer Pro NAC card (occupies 3 slots)

One or two** Intel® 200 MHz Pentium® Pro processors with 256 KB L2 cache

Two 2 GB internal mode 4 EIDE hard drives

Four ECC memory DIMM sites supporting up to 1 GB of memory. Four DIMMs may be installed in any combination in the following sizes: 64 MB, 128 MB, 256 MB

One 3.5" 1.44 MB floppy disk drive

Reset/Reboot button

EdgeServer Pro Peripheral NIC Card

Ultra-wide SCSI-3 interface

DB-15 SVGA video

Mini-DIN keyboard connector

Mini-DIN mouse connector

Optional Ethernet NIC Card

Two 10/100 Ethernet RJ-45 autosensing ports

One RJ-45 RS-232 serial port

EMI/EMC Regulatory

FCC Part 15, Class A; EN 55082; EN 55022, Class A

Safety

UL 1950; EN 60950; C-UL; CE-MARK

EdgeServer Operating System

Optional factory installed Windows NT Server 4.0

Server license and five client licenses

CD media

Getting Started documentation

Quad Modem Card

DTE Interface

Supports standard DTE rates up to 115,200 bps

Asynchronous operation

Synchronous operation (DCE supplies TxD clock)

Physical interface 1 SCSI-II 50-pin connector (converted via supplied cable to 4 EIA RS-232 25-pin female)

Error Correction

ITU-T V.42

MNP 2-4

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3Com Total Control

Total Control Multiservice Access Platform

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400 Bayfront Plaza
Santa Clara, CA 95052-8145
Phone: 1 800 NET 3Com
or 1 408 326 5000
Fax: 1 408 326 5001
World Wide Web:
www.3com.com

Asia Pacific Rim
Sydney, Australia: 61 2 9937 5000
Melbourne, Australia:
61 3 9866 8022
Beijing, China: 86 10 6849 2568
Shanghai, China: 86 21 6350 1581
Hong Kong: 852 2501 3111
India: 91 11 644 3924
Indonesia: 62 21 572 2088
Osaka, Japan: 81 6 536 3303
Tokyo, Japan: 81 3 5977 3266
Korea: 82 2 3455 6900
Malaysia: 60 3 715 1333
New Zealand: 64 9 356 9118
Philippines: 632 892 4476
Singapore: 65 538 9368
Taiwan: 886 2 2 377 5850
Thailand: 662 231 8151 5

3Com Austria
43 1 580 17 0

3Com Benelux B.V.
Belgium: 32 2 725 0202
Netherlands: 31 346 58 62 11

3Com Canada
Calgary: 1 403 265 3266
Edmonton: 1 403 423 3266
Montreal: 1 514 683 3266
Ottawa: 1 613 566 7055
Toronto: 1 416 498 3266
Vancouver: 1 604 434 3266

3Com Eastern Europe/CIS
Bulgaria: 359 2 962 5222
Czech/Slovak Republics:
120 2 21845 800
Hungary: 36 1 250 83 41
Poland: 48 22 6451351
Russia: 7 095 258 09 40

3Com France
33 1 69 86 68 00
Carrier and Client Access:
33 1 41 97 46 00

3Com GmbH
Berlin, Germany: 49 30 3498790
Munich, Germany: 49 89 627320

3Com Iberia
Portugal: 351 1 3404505
Spain: 34 1 509 69 00

3Com Latin America
U.S. Headquarters: 1 408 326 2093
Miami, Florida: 1 305 261 3266
Argentina: 54 1 312 5266
Brazil: 55 11 246 5001
Chile (also serving Bolivia and Peru):
562 633 9742
Colombia: 57 1 629 8847
Mexico: 52 5 520 7847/7867
Peru: 511 221 5398
Venezuela: 58 2 953 8122

3Com Mediterranean
Milan, Italy: 39 2 27301
Rome, Italy: 39 6 5225 1441

3Com Middle East
971 4 3[illegible]

3Com Nordic AB
Denmark: 45 3929 5000
Finland: 358 9 35 626 67
Norway: 47 22 62 73 00
Sweden: 46 8 632 05 00

3Com Southern Africa
27 11 807 4397

3Com Switzerland
41 84 803 939

3Com UK Ltd.
Aylesbury, UK 1296 318700
Dublin, IR 1 240 2900
Ireland: 3531 820 7077
Manchester, UK 161 873 0711
Marlow, UK 1628 890 000

Data Compression
ITU-T V.42 bis
MNP 5

Compatibility
ITU-T V.90 at 56 Kbps*
x2 technology at up to 56 Kbps*
ITU-T V.34 at 33.6 Kbps, 31.2 Kbps, 28.8 Kbps and slower speeds
V.FC at 28.8 Kbps
V.32terbo at 19.2 Kbps
ITU-T V.32 bis at 14.4 and 12 Kbps; 9600; 7200 and 4800 bps
(symmetrical and asymmetrical full duplex)
ITU-T V.32 at 9600 and 4800 bps
ITU-T V.22 bis at 2400 bps
ITU-T V.22 at 1200 bps
ITU-T V.32 at 1200/75 bps
ITU-T V.21 at 300 bps
Bell 208B at 4800 bps (synchronous)
Bell 212A at 1200 bps
Bell 103 at 300 bps
QuickConnect technology
Adaptive Speed Leveling® (ASL)
Fax Compatibility
V.17 at 14,400 bps; Group III; TIA/EIA Class 1, and TIA/EIA 592 Class 2.0
Call detection automatically switches between data and fax calls
Symmetrical or Full Duplex Operation
Efficient 2-way transfers for full duplex protocols and instantaneous response for interactive applications
Synchronous Transmission
From 1200 bps to 28.8 Kbps for communication with mainframes, bridges, routers or other synchronous devices
Cellular Support (optional)
MNP10EC
V.42ETC

T1 Features
Telco T1 interface via T1 application card
Modem initialization string and ANI/DNIS code storage (3 sets)
DS0 busy out
ANI/DNIS code dependent modem configuration
Supports ground start and loop start supervision and E and M, Type 2
Supports MF and DTMF addressing

Physical Dimensions
Application Card: 12.45 in. x 6.4 in.
Application Card: 4.85 in. x 6.4 in.

Power Requirements
1.5A @ 5VDC
0.1A @ 12VDC
8.7 watts
25 BTUs

Dual PRI Card

Primary Rate Interface Compliance
Compliant to AT&T technical publication TR41459 and compatible with AT&T ISDN PRI services per AT&T Laboratories testing
ISDN data link layer ITU-T Q.921
ISDN call control signaling ITU-T Q.931/I.451
Provides ANI and DNIS digits via Q.931 D-channel signaling
Supports NonFacility Associated Signaling (NFAS)

Central Office Switch Types Supported
AT&T 4ESS Custom
AT&T 5ESS Custom
Northern Telecom DMS-100 Standard
Northern Telecom DMS-250
INS 1500
National ISDN 2 (NI2)

Digital Data Compatibility
For end-to-end transmission over ISDN
ITU-T V.120/I.462
ITU-T V.110/I.463
Sync PPP (RFC 1717)

T1 Interface
Metallic interface per ANSI T1.403
CSU to T1 per AT&T Pub 62411
PRI interface per ANSI T1.408
D4 or ESF frame formats
B8ZS line coding
Integral CSU
- Auto equalization for data and clock recovery
- Range = 36dB at 772 Khz (6000 feet 24 AWG TP wire)

Supports local and remote loopbacks

LED Indicators
Run/Fail, Carrier, Loopback and Alarm status

Power/Heat
5 watts per card set/17 BTUs

Operating Environment
Temperature: 32°-104° F (0°-40° C)
Humidity: 0-95% (non-condensing)
Non-condensing

Physical Interfaces
RJ-48C T1/PRI connectors for span1 and span2
RJ-45 RS-232 connector for local management console
1/8 in. bantam monitor jacks

T1 Interface

Metallic interface per ANSI T1.403
CSU to T1 per ATT pub 62411
D4 or ESF frame formats
B8ZS line coding
Integral CSU
- Auto equalization for data and clock recovery
- Range = 36dB at 772 Khz (6000 feet 24 AWG TP wire)

Configurable E&M type II signal support including:
- Wink start or Immediate start
- Answer Supervision
- Feature Group B, Feature Group D, and others
- DNIS and ANI address signaling

Supports ground start and loop start supervision
Supports MF and DTMF addressing
Supports local and remote loopbacks

Physical Interfaces
RJ48C connectors for span 1 and span 2 on T1 NIC
Bantam monitor jacks for span lines 1 and 2 on T1 NIC
RJ45 for local management console

LED Indicators
Run/Fail, Carrier, Loopback, and Alarm status

Power/Heat
5 watts per card set/17 BTUs

Operating Environment
Temperature: 32°-104° F (0°-40° C)
Humidity: 0-95% (non-condensing)

* Capable of receiving downloads at up to 56 Kbps and sending at up to 31.2 Kbps. 56K download capability requires compatible phone line and provider/host server equipment. Actual download speeds may be lower than 56 Kbps due to telecommunications regulations, varying line conditions, and other factors. This product complies with the 56K V.90 ITU standard and x2 technology. ITU standard ratification is expected in September 1998. See www.3com.com/56k for details.

**Visit www.3com.com for availability of drivers supporting second processor.

*** For our customers with existing x2 technology (and products upgraded to x2 technology), we guarantee a free upgrade to the V.90 standard. You must claim your free upgrade by December 31, 1998. See www.3com.com/56k for details.

To learn more about 3Com products and services, visit our World Wide Web site at http://www.3com.com.

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Read product information for the 3Com CommWorks Total Control HiPer Access Router Card (002106-01)

This product is currently not available for purchase at any of the stores we search

The HiPer Access Router Card Set is a complete solution for Internet service providers, telcos and large corporate networks that require high-performance routing technology. The HiPer Access Router Card is part of the HiPer Access System and is used in conjunction with HiPer DSP Cards to form a complete solution for unparalleled remote access performance. The HiPer Access Router Card supports and routes 336 analog or ISDN dial-up calls via T1 or T1-PRI connections, or 420 analog or ISDN dial-up calls via E1 or E1-PRI connections. Two HiPer

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Access Router Cards may be configured in a single Total Control HiPer Access System to provide statistical redundancy for increased routing performance.

Standards and Protocols

Management Protocol	SNMP

Miscellaneous

MPN	002106-01
Product ID	20194173

Additional resources

Router Technology
Free e-Book download: "Architecting Next-Generation Networks"
www.gobroadcom.com

Routers at Amazon.com
ow prices and huge selection. Qualified orders over $25 ship free
mazon.com/tools

Broadband Router
Broadband Networking at Dell
www.dell4me.com

Hubs, Routers, & Switches
Top Brands new/used/refurb with up to 90% off retail w/ warranty.
www.networkliquidators.com

Routers at Best Buy
Shop Best Buy today for the latest Routers & more networking products!
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ebay Search for 002106 01

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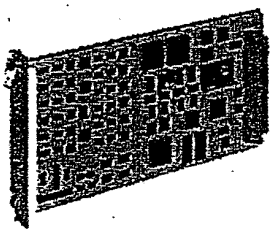
Read product information for the 3Com Total Control 1000 HiPer DSP Card Set (002092-00) Modem

This product is currently not available for purchase at any of the stores we search



The advanced design of the HiPer DSP card set enables multiple modem sessions, ISDN processing, voice-codecs, and PPP co-processing on a single DSP (digital signal processor)- delivering a high level of functionality in a small space. The card set can process a T1/E1 spans worth of channels (24 or 30 channels respectively) while occupying just one platform slot. In a fully populated Total Control 1000 platform, the HiPer DSP card set can handle up to 336 calls via T1 and up to 420 calls via E1. Unlike a simple modem card, the HiPer DSP card set features a fully reprogrammable digital signal

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processing engine that lets administrators reconfigure the system to implement new technologies and applications such as voice-over-IP. The card set supports a full range of trunk and communications standards, including many variations of CAS/PRI 56K V.90, 3Com x2 technology, and all of the most common ITU-T and Bell communications standards and rates (including V.34, V.32terbo, V.32, and V.32bis...

Key Features	
Type	ISDN Terminal Adapter
Connectivity Technology	Wired
Platform	PC
Protocols	
Analog Modulation	ITU V.34, ITU V.32bis, ITU V.32, ITU V.17, ITU V.22bis, ITU V.22, ITU V.90, ITU V.21, Bell 212A, Bell 103, Bell 212, Bell 208B
Error Correction	ITU V.42, MNP-4, MNP-3, MNP-2
Data Compression	ITU V.42bis, MNP-5
Digital Signaling	ISDN PRI
Other Features	
56K Technology	V.90, X2
Warranty	
Warranty	2 Years
Miscellaneous	
Package Qty.	1
MPN	002092-00
Product ID	20162023

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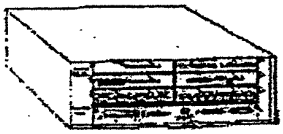
Read product information for the Cisco 7206 VXR Router (C7206VXR/400/2FE)



> Compare prices at 5 stores
> See product details
> Write a review at Epinions.com

Enterprise and service provider customers continue to drive the need for . optimizing operational and management costs, simplifying network management and increasing revenue opportunities. The Cisco 7200 addresses these requirements by collapsing functions previously performed by separate devices into a single, cost-effective platform. Through functional integration, the Cisco 7200 high-performance multifunction platform provides a single, cost-effective platform.The Cisco 7200 series delivers exceptional price/performance to meet the requirements of both enterprise and service providers. With its combination of

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scalable performance, density, and low per-port pricing, the Cisco 7200 allows network-layer capabilities to be extended to a much wider range of network configurations and environments. Customers can now gain the advantages of high-performance network-layer switching and services, including security, QoS, and traffic management to more locations throughout the network.Th...

Standards and Protocols	
Management Protocol	SNMP, Telnet
Memory	
Installed RAM	128 MB
Installed Flash Memory	48 MB
Dimensions	
Width	16.82 in.
Depth	17.02 in.
Height	5.24 in.
Weight	50.05 lb.
Miscellaneous	
MPN	C7206VXR/400/2FE
Product ID	20218090

> Compare prices on the Cisco 7206 VXR Router (C7206VXR/400/2FE)

Additional resources

Routers
Secure & assured routing solutions for large scale networks. Reliable.
www.juniper.net

Routers at Amazon.com
ow prices and huge selection. Qualified orders over $25 ship free
Amazon.com/tools

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AMENDED AND RESTATED EXHIBIT A
Verizon/WCOM CyberPOP™: Lucent TNT Equipment Configuration (5/14/01)

T1/DC CONFIGURATION (480 modem ports per chassis)

Part No.	Description	Qty.	Virtual COBRA Price (US$)
TNT-2DC-H	TNT Chassis, Shelf Controller, Dual DC Power, 19" Rack Mount Kit, 32 MB DRAM, 32MB Flash Memory, and Heat Baffle.	1	$1
TNT-SL-48MODV3-S-C	48-Port Modem Card (V.90 and V.34 compatible)	10	$10
TNT-SL-HDLC2	96 Channel HDLC Slot Card	1	$1
TNT-SL-CT1	T1 Slot Card	3	$3
WCOM COBRA SW	WCOM TNT Custom Software Bundle (WCOM use only)	1	N/C
Total System Price			**$15**

Pricing Notes

1. Virtual COBRA pricing ($1/part) valid only for RAS Equipment purchased by Verizon for use in support of WCOM's purchase of CyberPOP service from Verizon

2. Prices are exclusive of EF&I hardware and services (e.g., racks, panels, cables, OOB mgmt devices, ancillary components, rack/stack services, and site preparation, engineering, and installation services and materials), which are the responsibility of Verizon

3. In lieu of the ten (10) TNT-SL-48MODV3-S-C modem cards, five (5) APX8-SL-96DSP modem cards may be used for new deployments in accordance with mutually-coordinated configuration changes.

4. Prices are exclusive of shipping, insurance, taxes, and duties, which are the responsibility of Verizon

UUNET/QWEST COBRA SERVICE SCHEDULE: EXHIBIT 2

Lucent T1 /DC TNT (Fully Loaded @ 480 Ports + 1 extra free T1 Slot Card)

Price excludes shipping, insurance, and taxes, which are the responsibility of Qwest

Special Quantity Discount				82.0%		
Part No.	**Qty.**	**List Unit Price**	**List Ext. Price**	**Disc. (%)**	**Unit Disc. Price**	**Disc. Ext. Price**
TNT-2DC-H	1	$ 25,750	$ 25,750	82.0%	$ 4,635	$ 4,635
TNT-SL-48MODV3-S-C	10	$ 27,600	$ 276,000	82.0%	$ 4,968	$ 49,680
TNT-SL-HDLC2	1	$ 9,600	$ 9,600	82.0%	$ 1,728	$ 1,728
TNT-SL-CT1	3	$ 9,200	$ 27,600	82.0%	$ 1,656	$ 4,968
TNT-SL-CT1	1	$ 9,200	$ 9,200	100.0%	$ -	$ -
TNT-SO-FR	1	$ 4,000	$ 4,000	82.0%	$ 720	$ 720
TNT-SO-ISDN	1	$ 4,000	$ 4,000	82.0%	$ 720	$ 720
TNT-SO-L2TP	1	$ 7,000	$ 7,000	82.0%	$ 1,260	$ 1,260
Total TNT Price			**$ 363,150**			**$ 63,711**

Qwest Purchase Commitment (# TNTs) 300

Qwest Purchase Commitment (Total $) $ 19,113,300

Lucent Technologies
Bell Labs Innovations

Frequently Asked Questions
TAOS 9.0 for MultiVoice™

1. ***What is the True Access Operating System (TAOS)?***

   The True Access™ Operating System (TAOS) from Lucent Technologies is the multiservice, real-time operating system software embedded in the APX 8000™, Stinger™, MAX TNT®, MAX™, SuperPipe, and Pipeline® family of access platforms. TAOS provides the widest range of solutions for WAN access environments and represents the brand name for the leading WAN access feature set for service providers and corporate enterprises. TAOS underlines the Lucent heritage in WAN access solutions and its commitment to research and development to ensure continued leadership in the market.

2. ***What edge access platforms does TAOS 9.0 for MultiVoice support?***

   TAOS 9.0 for MultiVoice™ supports the following industry-leading access platforms:

   APX 8000, MAX TNT, and MAX 6000. Lucent plans to support the MAX 3000 and SuperPipe Plus in the second quarter of 2001 in TAOS version 9.1.

3. ***What are the major features within TAOS 9.0 for MultiVoice?***

   TAOS 9.0 for MultiVoice is a major release that enables "Universal Port" capabilities on the APX 8000 and MAX TNT platforms. Universal Port supports multiple applications including simultaneous analog and digital modems for remote access, voice- and fax-over-IP, and virtual private networks (VPNs) using any available port processor resources on the 96- or 48-port MultiDSP modules.

   Specific MultiVoice features include application support for residential 1+ long distance (LD) and 1010 dial-around services, and call routing programmability in and out of the voice-over-IP (VoIP) network based on dialed number identification service (DNIS) or trunk group. In 2-stage dialing scenarios (calling card), you can implement programmability for authentication and routing based on Automatic Number Identification (ANI), DNIS, trunk group, and/or password. Other features include custom branding (announcements), arbitrary break-in announcements, sequential dialing, and support for operator assistance/calling card balance recharge. **Please note that 1+ LD and 1010 dial-around services require Feature Group D support that is available only in North America and other select regions.**

4. ***What is "Universal Port"?***

   "Universal Port" functionality enables the MAX TNT and APX 8000 platforms to configure the digital signal processor (DSP) automatically for the type of incoming call—dial-up (V.90 modem or ISDN), VoIP, fax-over-IP, and virtual private network (VPN)— accommodate it on any available port, and process it for transport over a packet-based IP network. **Please note that "Universal Port" is not supported on the MAX 6000 or MAX 3000 at this time.**

5. ***Which slot cards support "Universal Port" with the MAX TNT and APX 8000 platforms?***

   The 48-port MultiDSP slot card(s), and the 96-port MultiDSP card(s) are needed to support the "Universal Port" feature. Part numbers are as follows:

   - 48-port MultiDSP cards (TNTV-SL-ADI-C)
   - 96-port MultiDSP cards (APX8-SL-96DSP)

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6. ***Can the same chassis house the 48-port MultiDSP and 96-port MultiDSP slot cards?***

   As of TAOS 9.0, you may mix the 48- and 96-port MultiDSP cards in a single chassis for data applications only—that is, you can mix them for V.90, ISDN, VPN, etc., but not when running a VoIP service at this time.

7. ***Are there any limitations of the 96-port MultiDSP vs. the 48-port MultiDSP?***

   Yes, the 96-port MultiDSP card can be used as a modem or a voice coder. This card supports G.711 and G.729 (a) only. In addition, every port can support fax-over-IP, either as transparent fax transport (carried as G.711 PCM with no echo cancellation) or fax relay (T.38 based). The 48-port MultiDSP card supports analog and digital modems, fax-over-IP, and all supported MultiVoice codecs including G.711, G.729a, G.723.1, G.728, and RT-24.

8. ***How do I upgrade TAOS on an existing MAX TNT or APX 8000 platform with MultiVoice hash code? Is there a charge to obtain the software?***

   The software is free to existing MultiVoice customers. To obtain the software and release information, go to the following URLs:

   MAX TNT: ftp://ftp.ascend.com/pub/Software-Releases/MaxTNT/
   APX 8000: ftp://ftp.ascend.com/pub/Software-Releases/APX/

7. ***Can I upgrade my existing remote access concentrator for the MAX TNT and APX 8000 platforms to support MultiVoice TAOS 9.0 with "Universal Port?" and is there a cost?***

   Yes, you need the following components to create and contribute to the programmability of the MultiVoice with the "Universal Port" solution:

   - MultiVoice Hash Code
   - MultiVoice Access Manager 3.1 (MVAM 3.1) or Lucent Softswitch 3.0
   - Lucent Worldwide Services for MultiVoice Networks
   - Add-on applications from Lucent or a MultiVoice approved third-party vendor (see http://www.lucent.com/ins/map) *(Optional)*
   - MultiVoice Settlement Engine 1.0 *(Optional)*
   - Either 48- or 96-port MultiDSP cards to support VoIP, fax-over-IP, and all data applications.

   You are also required to install the Feature Group D hash code option on each gateway that will support interexchange carrier (IXC) traffic in a MultiVoice network using the MultiVoice Access Manager 3.1 as the gatekeeper.

   The Lucent sales force and technical support teams are available to answer questions and assist you with information and pricing regarding your existing network and business needs. For additional support, you may also contact certified Lucent distributors and system integrators directly or go to the Lucent Web site at (http://www.lucent.com/ins/products/multivoice) for more information on the MultiVoice for the MAX product.

10. ***If I decide not to upgrade to TAOS 9.0, will Lucent still support the older versions of TAOS?***

    Yes, but you should consider upgrading to version 9.0 for its enhanced features, performance and functionality—and it is FREE!

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